M.A.R.S. Making Aerospace Real for Students

Jan. - Feb. 2004

News

AEROSPACE EDUCATION

Inspiring Students to Excel

IN THIS ISSUE

Topics of Interest

Aerospace Education News is the official bi-monthly publication of the Civil Air Patrol and is produced by the Leadership Development and Membership Services Directorate, CAP National Headquarters, Maxwell AFB, Alabama.

Jim Mallett.....Director
Judy Rice.....AE Deputy Director
Judy Stone.....Editor
Peggy Greenlee.....Layout/Graphics

Contributing Writers:
Kathy Baucum
Joan Emerson
Ben Millspaugh
Jeff Montgomery
Claudine Sayegh
Barry Spink
Beth White

AE Partners.....Technical Articles
Printing Service.....Terry Fontaine and the CAP Print Plant

If you have news, events, or ideas we might consider for the newsletter, please submit them electronically to jstone@cap.gov.

Your AE Staff

WHO WILL BE AT NCASE 2004? WILL YOU?

National Congress on Aviation and Space - 2002 Seminar

Will you be one of the attendees that will experience motivating speakers, national standards-based, hands-on sessions, useful networking opportunities, and exciting exhibitors? The National Congress on Aviation and Space Education (NCASE) is the premier aerospace education conference in the nation. In 2004, NCASE will feature such noted speakers as Jim Voss, former International Space Station crewmember and currently Associate Dean of Engineering for External Affairs at Auburn University; Dr. Betsy Rogers, National Teacher of the Year; Ken Blackburn, world record holder for paper airplane sustained flight and Boeing engineer; Gus McLeod, is attempting the first solo circumnavigation of the poles. Joe Edwards, former Navy fighter pilot and astronaut, and current Chairman of the National Science Center; and Scott Crossfield, famed aviator and X-15 test pilot.

The theme of "Teaching Today for Tomorrow" will be evident in all aspects of this year's conference. From "Hangar Talk" with Scott Crossfield, Joe Edwards, Gus McLeod and Jim Voss to the "Careers in Aerospace" seminar with many noted aerospace professionals, this conference will open your eyes to the skills and opportunities waiting for the next generation. Concurrent sessions will show you how to excite and motivate your students for the future.

"Conversation with the Silver Eagles" (Tuskegee Airmen, Women Air Force Service Pilots, Mary Feik - WWII aircraft maintenance instructor and NASM aircraft restorer) will allow you to appreciate the dedication and commitment of early aviation greats. In addition, off-site programs will be offered to help you further understand the role Atlanta, Georgia plays in aviation and science enrichment.

Be at the Atlanta Marriott Marquis in Atlanta, Georgia on March 24-27, 2004 for ***the*** conference of 2004 - The National Congress on Aviation and Space Education! Don't miss out!!!

For more information and registration, go to: *http://www.cap.gov/events/ncmain.html.*

INSIDE NCASE 2004

The 37th annual National Congress on Aviation and Space Education conference, 2004 is **the** place to be to hear great speakers and wonderful programs, and **the** place to attend world-class national standards-based sessions with motivational and professional leaders. Some examples of the many sessions offered are:

- Explore long duration space flight with a special emphasis on the study of the red planet Mars.
- Explore World War I aviation history as you build a Sopwith Camel display.
- Investigate Online Aerospace Education resources.
- Research flight with X-Gliders.
- Explore aerospace graphing.
- Investigate integrating roles-based space simulations for your classroom.
- Discover resources from the National Air and Space Museum.

Jim Voss - 2004 NCASE Speaker

Gus McLeod - 2004 NCASE Speaker

- Attend a Share-A-Thon . . . . . and more!

Off-site experiences that are available include:

- Fernbank Museum
- SciTrek Museum

A special feature for the Homeschool audience will be a "Family Time" room permitting one Homeschool parent to attend sessions and the other parent to participate in a quality, educational experience with their Homeschool child.

Special door prizes will include:

- One week at Educator Space Camp at Huntsville, Alabama
- FlightSafety simulator sessions
- Delta on-site training school
- ……. and more!

This conference is also a great continuing education value, rated for 30 contact hours of continuing education credit.

Be sure and be in Atlanta on March 24-27, 2004 for the National Congress on Aviation and Space Education conference!!!

COMING ATTRACTIONS

CAPMart …your bookstore, apparel, and supply place!

IS HERE!

It's about quality service to the membership! It's about products made in America! It's about free shipping! The operation includes a new online ordering option and is on the fast track to success.

CAPMart now has a list of recommended items in stock to support the Aerospace Program and is eager to serve you. These items include, but are not limited to, the Estes Rockets and many of the Toys in Space items. In order to expedite your order please visit us at www.capmart.org to check out all the items available. Pictures of each product will soon be aligned with the items listed for ease in ordering. If you have any questions about the products for the Aerospace Program please email Roy Calvert at: **rcalvert@capnhq.gov.** He will be glad to assist you. Roy and the CAPMart staff are waiting to make your ordering a simple one-step process. Make CAPMart your one-stop shopping headquarters for Aerospace Education products.

NEWS ABOUT THE RED PLANET

Spirit and *Opportunity,* the rovers launched to Mars on June 10, and July 7, 2003, will land on the Red Planet in January. *Spirit* lands on January 3, and *Opportunity* will land three weeks later on January 24. To find out more about the Mars mission and download Mars lesson plans and resources, go to *http://mars.jpl.nasa.gov/mer/.*

IN THE AEM SPOTLIGHT...

Margy Natalie is a public school teacher in Fairfax County, Virginia. She is currently on loan from the school system to the National Air and Space Museum as an Aerospace Teacher in Residence. While in residence at the Air and Space museum she is working on writing curriculum and teaching lessons at the Steven F. Udvar-Hazy Center which opened on December 15th, 2003. This museum is located just south of Dulles Airport in Northern Virginia and houses many of the larger pieces of the Smithsonian collection as well as many other items from the Smithsonian's storage facilities.

In Fairfax County, Mrs. Natalie's most recent assignment was at Rachel Carson Middle School where she was a special education/science teacher. While at Rachel Carson, she has sponsored an aviation club that has used many of the lessons from the AEX II book, as well as building models and flying control-line airplanes with the help of the Northern Virginia Control -Line Club. She also coached the Wright Stuff event for the Science Olympiad competition. With the help of members of the Capital Area Antique Modelers Association, the Carson teams placed first and second in Virginia for 2003. Before moving to Carson, Mrs. Natalie taught 6th grade at Bush Hill Center for students with physical disabilities. Mrs. Natalie tries to incorporate aerospace into her classes whenever possible. She has used paper airplanes to teach reading, following directions, measuring, and graphing. She has also used airplanes to explain everything from convection to Newton's Laws.

Mrs. Natalie holds a Private Pilot Single Engine Land Certificate and has been flying for 10 years. She and her husband own a 1950 Ryan Navion that is currently being restored after an engine failure. Mrs. Natalie enjoys spending her free time in the summer performing owner assisted annuals in time to get the plane to Oshkosh for the air show. Her first experience with the Civil Air Patrol was watching the cadets secure the camping area at Oshkosh after a severe thunderstorm.

Margy Natalie and husband in 1950 Ryan Navion

Mrs. Natalie's first educational experience with Civil Air Patrol was her visit to NCASE in 2001, held in the Washington DC area. She found it to be a wonderful experience and was thrilled when a local CAP volunteer showed up in her classroom the last day of school that year and told her about a CAP teacher's workshop to be offered that summer. She joined as an AEM member and has enjoyed workshops and NCASE ever since.

The editor acknowledges the excellent support and professional services provided by Terry Fontaine and the Civil Air Patrol Print Plant, without whom this newsletter would not be possible.

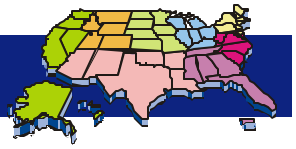
CONGRATULATIONS to Fall 2003

AFA Aerospace Education Foundation

$250 Grant Winners!

- *Beth E. Allaire*-Dayton, OH
- *Susan B. Brown*-New Haven, CT
- *Laura A. Calhoun*-Temple, TX
- *Eugene E. Castleberry* -McGregor, TX
- *Deborah L. Christopher*-Muncie, IN
- *Vivian L. Dodgen*-Waco, TX
- *Jill B. Droppa*-Lake Ariel, PA
- *Lynne M. Hookstadt*-Camarillo, CA
- *James W. Johnson*-Sugarcreek, OH
- *Debbie O. Peavy*-Montgomery, AL
- *Donna M. Persinger*-Sissonville, WV
- *Grace S. Quantock*-Montgomery, AL
- *Chantelle M. Rose*-Saint Paris, OH
- *Amy L. Salter*-Montgomery, AL
- *Anthony T. Servello*-Leonardtown, MD
- *Belinda B. Smith*-Hewitt, TX
- *Tracey A. Stark*-Sarasota, FL
- *Carol M. Tew*-Montgomery, AL
- *Tyrone D. Thompson*-Newark, DE
- *Sandra L. Urbaniak*-Conde, SD

REGION TO REGION



NORTHEAST REGION

March 5-6
New Jersey Association for Gifted Children's annual conference will be held at the Westin Forrestral Village in Princeton, NJ. For more information, go to: *http://www.njagc.org/Conference/conference.htm.*

MIDDLE EAST REGION

January 23-25
Science Van Project by Delaware Aerospace Center targets teachers in grades 9-12 for this workshop at Brighton Suites in Rehoboth, Delaware. Contact Kathy Melvin at *kmelvin@doe.k12.de.us.*

GREAT LAKES REGION

February 18-20
Hoosier Association of Science Teachers, Inc. (HASTI) will be meeting in Indianapolis, IN. Contact information at: http*://www.hasti.org/convention/convention.html.*
February 20-21
Wisconsin Elementary and Middle School Science Teachers (WEST) will hold their convention at Sevens Point, WI. For further information, go to: *http://www.westsci.org/2004.html.*
March 4-6
Michigan Science Teachers Association (MSTA) will hold its annual convention in Lansing, MI. For more information, go to: *http://www.msta-mich.org/conference2004/index.php.*
March 11-13
Wisconsin Society of Science Teachers (WSST) will hold their convention in Appleton, WI. For more information go to: *http://www.wsst.org/convention/.*

SOUTHEAST REGION

January 24
Sally Ride Science Festival will be held at Brevard Community College, Cocoa Campus, Florida. For more information, go to: *http://www.sallyridefestivals .com/04florida0124/ index.shtml.*

NORTH CENTRAL REGION

February 26-27
Nebraska Association for the Gifted's annual conference will be held at the Holiday Inn in Kearney, NE. For more information, go to *http://www.nebraskagifted.org/conference.html.*

SOUTHWEST REGION

February 6-7
10th Annual International Space Station Educators Conference will be held at Space Center Houston in Houston, TX. Sponsored by Boeing, NASA, and Southwest Airlines. For more information, go to: *http://www.spacecenter.org/iss.html.*
March 6
Sally Ride Science Festival will be held at Barrett Honors College, Arizona State University. For more information, go to: *http://www.sallyridefestivals.com/04asu0306/index.shtml .*

ROCKY MOUNTAIN REGION

February 7
Utah Science Teachers Association (USTA) will meet for their conference in Provo, UT. For more information, go to: *http://www.usoe.k12.ut.us/curr/science/usta/ustadir.html.*
March 18-20
The International Technology Education Association's 66th Annual Conference will be held in , Albuquerque NM. For more information go to: *http://www.iteawww.org/D.html*

PACIFIC REGION

March 11-13
15th Annual International Women in Aviation Conference will be held at the Reno Hilton in Reno, Nevada. For more information, go to: *www.wai.org.*

ALBERT EINSTEIN DISTINGUISHED EDUCATOR FELLOWSHIP PROGRAM SEEKS APPLICATIONS

The Albert Einstein Distinguished Educator Fellowship Program is seeking applications for 2004-05. The program offers current public or private elementary and secondary mathematics, technology, and science classroom teachers with demonstrated excellence in teaching an opportunity to serve in the national public policy arena. Fellows provide practical insight in establishing and operating education programs. Fellowships increase understanding, communication, and cooperation between legislative and executive branches and the science, mathematics, and technology education community.

Highly accomplished science, math, and technology teachers (K-12), with at least five years teaching experience are encouraged to apply on-line at: *www.scied.scence.doe.gov.* The paid fellowships ($5,000 per month) give teachers a voice in Washington at many Federal agencies with science missions and with policymakers on Capitol Hill. Relocation and professional travel allowances are also provided. Successful applicants will be invited to interview in Washington DC in April. For more information, visit *www.triangle-coalition.org/ein.htm.* Applications close February 1, 2004.

AEO NEWS AND VIEWS

2003 Crown Circle Awardees and Escorts

NOMINATIONS FOR 2003 AE AWARDS DUE

The Frank G. Brewer Civil Air Patrol Memorial Aerospace Award recognizes those who make outstanding contributions to aerospace education. Nomination categories are (1) cadet, (2) senior member, and (3) individual or organization. All nominations are due to the Wing DAE no later than February 1, 2004 using the format shown in CAPP 15.

Nominations for the National Congress Crown Circle for Aerospace Education Leadership Award should be submitted to NHQ CAP/LMA and must be postmarked on or before January 1, 2004.

Nominations for the A. Scott Crossfield Aerospace Education Teacher of the Year Award are also submitted to NHQ CAP/LMA and must be received by February 1, 2004. See CAPR 280-2 and *http://level2.cap.gov/index.cfm?nodeID=5505* for more information.

Wing DAEs - Don't forget to submit your Aerospace Education Activity Report to NHQ CAP/LMA by Feb 15, 2004 so your wing can be considered for the Aerospace Education Mission Award. Please feel free to include any supporting documents or information to support your Activity Report. Wing Plan of Actions are not required but are submitted by many wings, and we appreciate having your plans on file.

NEW SPACE MODULE WEB BASED

As mentioned in the last AE newsletter, we are developing a supplemental space module to be placed on our web site. By the time this newsletter hits the field, the module should be completed and on the web site.

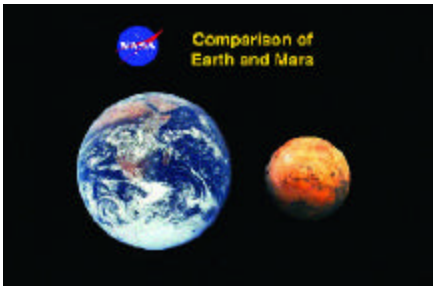
This module will contain a current look at the International Space Station, Mars, Satellites and Satellite Tool Kit, X-PRIZE, Astronomy, and the Business of Space. It is being written as a supplement to Aerospace Dimensions, but hopefully members of all ages will find the information educational and interesting. Look for it on our web site.

AEROSPACE EDUCATION FOUNDATION GRANTS WINTER DEADLINE: DECEMBER 31, 2003

The Air Force Association established the Aerospace Education Foundation (AEF) in 1956 to provide educational opportunities to America's youth. As part of their program, the AEF provides CAP units the opportunity to receive $250 in grant money once every other year. Since 1996, AEF has provided over $100,000 to CAP to help fund their aerospace education programs.

Has your squadron applied for this grant? If your squadron has received a grant two years ago, is it perhaps time to apply again? The deadline to submit applications for the winter competition is December 31, 2003. For details and the application form visit: *http://level2.cap.gov/index.cfm?nodeID=5505*

Answer to Cappy's Quiz: d



Earth's diameter is 12,756 km. The diameter of Mars is 7,794 km.

AEO IN THE SPOTLIGHT

Lt Col Clarence Hauck, CAP

Lt Col Clarence Hauck began his interest in aviation as a young boy growing up in Idaho where he started his CAP career as a cadet. When asked about his days as a cadet, he will readily relate his memories from his very first airplane ride. Following in the footsteps of the wonderful military men and women who work with our cadets, Lt Col Hauck joined the United States Air Force. His love of the Air Force and Civil Air Patrol led him from active duty to serving as a CAP-USAFR for the state of Mississippi. He was actively involved in encampments, search and rescue training, Hawk Mountain, aerospace education, and leadership training.

Upon retiring from the USAF Reserve, he became a member of CAP once again and was asked to serve as the Wing Director of Operations (DO). As DO, he developed a wing-wide operations training program resulting in an Search and Rescue/Disaster Relief Evaluation rating of Outstanding in 1999 and 2000. He was also instrumental in putting together a Cadet Glider Flight School in Mississippi.

In 2001, Lt Col Hauck took the helm of a dormant aerospace education program. In three years he brought it to the forefront of the educational realm in the state. Representing CAP aerospace education outreach, he made presentations or conducted workshops at NASA, the State Office of the Superintendent of Education, the Mississippi School Board, the Mississippi Gifted Teachers Association, the Mississippi Homeschool Conference, the Sheriff's Association, the Mississippi Wing Conference, the National AEO School, and the CAP National Board. He has tirelessly served as the coordinator for Mississippi Aerospace Education Space Day by laying the groundwork within individual schools, arranging speakers, providing assistance in rocketry, reading to students, and organizing airport visits. Many schools are now utilizing CAP classroom materials, participating in the AEX program and showing an interest in the cadet school program due to his diligent efforts. Not content to just see an improvement in the outreach program, he has increased the number of seniors completing the Yeager Award, and has initiated an aerospace education contest and a Mississippi Wing Aerospace Education Award. Winners are recognized each year at the wing conference.

He holds a master rating in aerospace education and has received the Mississippi Wing Aerospace Education Award, Southeast Region Brewer Award, Senior Member of the Year Award, Wing Staff Member of the Year and numerous Meritorious and Exceptional Service Awards.

We congratulate and honor one of CAP's best.

Which of the following statements about Mars is **not** correct?

a. In 1997, the space probe called the Mars Pathfinder landed on Mars.
b. The primary mission of Viking 1 and Viking 2 was to determine if life ever existed on Mars.
c. Mars' reddish tint is caused by the rock and dust covering the surface of Mars.
d. Experiments on Mars have never indicated any water, past or present, on Mars.

CURRICULUM CORNER

SURVEYING THE BLOCKS OF MARS

This activity is from a wonderful NASA site called NASAexplores. You can download many exceptional lesson plans for K-12 at www.NASAexplores.com.

MARS FACTS:

- Mars is a planet in our solar system (fourth from the Sun).
- Mars is smaller than Earth (about 1/2 the equatorial diameter). If you weighed 100 pounds on Earth, you would weigh only 38 pounds on Mars.
- The surface of Mars is very dry.
- The polar regions are the coldest part of the planet. (The polar caps are a combination of water ice and carbon dioxide ice, with layers of dust.)
- The forces shaping the surface changed over time. (The primary force currently changing the surface of Mars is erosion due to strong gusting winds associated with seasonal dust storms.)
- The atmosphere is extremely thin.

SURVEYING THE BLOCKS OF MARS

Grade Level: 9-12

Objective:
Students will simulate the remote sensing capabilities for NASA's flying Martian probe.

NATIONAL SCIENCE STANDARDS:

Content Standard A: Science as Inquiry
Understanding about scientific inquiry

Content Standard E: Science and Technology
Understandings about science and technology

Unifying Concepts and Processes
Evidence, models, and explanation

NATIONAL MATHEMATICS STANDARDS:

1. **Number and Operations Standard**
   Compute fluently and make reasonable estimates.
4. **Measurement Standard**
   Understand measurable attributes of objects and the units, systems, and processes of measurement.
9. **Connections Standard**
   Recognize and apply mathematics in contexts outside of mathematics.

Background:

The ARES (**A**erial **R**egional-scale **E**nvironmental **S**urvey of Mars) Project will be designed to fly an airplane, called Eagle, 850 kilometers over the Martian surface. Eagle is designed to take measurements of the atmosphere and high-resolution surface pictures to improve our existing knowledge of Mars. With this knowledge, we hope to get a better picture of Mars' past, and how we can make the best use of Mars for future missions.

The Eagle will send a signal down to the surface of Mars as it flies over. The signal will reflect back to the Eagle. The return signal will be processed for data about the surface. Knowing the speed of the signal, and the time it takes for the signal to return, one can determine the distance from the Eagle to the ground. This process should reveal all of the many small features of the surface that satellites could not show. Using the equation **d=vt**, where **d** is the distance traveled in meters(m), **v** is the speed in meters per second (m/s) (in this case that would be close to the speed of light in a vacuum which is $3x10^8$ m/s), and **t** is the travel time in seconds (s) (which is the **number** in the chart $x10^{-6}$ seconds because one second equals $1x10^{-6}$ microseconds), we can make a three-dimensional (3D) map of the surface.

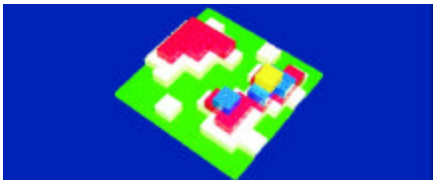
In this activity, students (as part of the NASA team on Earth) will take the data received by the Eagle and process it to create a 3D map of the Mars terrain.

Materials:

Student sheets, calculators, and plastic, interlocking blocks (all the blocks need to be the same height or thickness; the color of the blocks is not important), a platform to build on. For best results, use a 20 x 20 dot grid of plastic, interlocking blocks.

Procedure:

1. Each group will have a data table taken from a possible mission of the Eagle.
2. With the data, they will calculate the distance using the equation provided.
3. Knowing the distances, the groups will construct a topographic map of the terrain of Mars using the plastic, interlocking blocks.



Continued on the next page.

Surveying the Block of Mars (Continued)

Example for the 17 block on the table would be:

Step 1:

d=vt

$d=(3x10^{8}\ m/s) \times (17x10^{-6}s)$

d= 5100 m

Step 2:

divide by two

d=2550 m

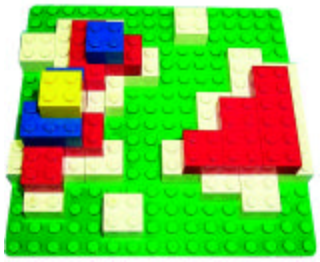
Step 3:

subtract this from 2550

d=0 m

This means the blocks that are listed as 17 on the table would be ground level, thus no blocks are required. Repeat this for each numbered block on the chart.

Data Table: (Bottom left.) Each number represents the time for the Eagle's signal to travel to the Martian surface, reflect, and travel back to the Eagle. The unit for time in this chart is microseconds.

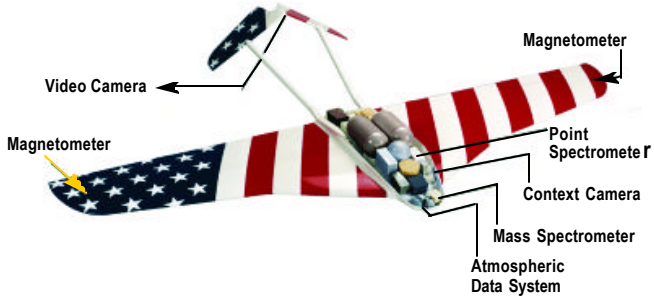


Student recording sheet:
(Bottom Right)

1. Use the equation d=vt and find the distance for each time.
2. Divide that distance by 2.
3. Subtract that number from 2,550 m.
4. Record that number in the chart in the same place as the time.
5. Once you have these numbers, you can construct the surface of Mars using the interlocking blocks. Assume that each block's thickness is equal to 150 m on the Martian surface.

Answer the following questions:

1. Do you think this is an accurate representation of the Martian surface? Why or why not?
2. What would improve the accuracy of your 3D map?
3. What assumptions have we made in making this map?
4. Would the Eagle do a better job of mapping Mars than a satellite in orbit? Explain.



Data Table

17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
17	17	17	17	17	17	17	17	17	16	16	17	17	17	17	17
17	17	16	16	16	16	17	17	17	16	16	17	17	17	17	17
16	16	16	15	15	16	17	17	17	17	17	17	17	17	17	17
16	16	16	15	14	14	15	16	17	17	17	17	16	16	17	17
17	17	16	15	14	14	15	16	17	17	17	17	16	16	16	16
17	17	16	15	15	16	17	17	17	17	17	17	16	15	15	16
17	17	14	14	16	16	17	17	17	17	16	16	16	15	15	16
17	16	13	13	16	17	17	17	17	17	16	15	15	15	15	16
17	14	13	13	15	17	17	17	17	17	16	15	15	15	15	16
16	14	14	14	15	16	17	17	16	15	15	15	15	15	15	16
16	15	15	16	16	16	17	17	16	15	15	15	15	15	15	16
17	15	15	17	17	17	17	17	17	17	16	16	16	16	17	17
17	16	16	17	17	16	16	17	17	17	17	17	16	16	17	17
17	17	17	17	17	17	16	16	17	17	17	17	17	17	17	17
17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17

Student recording sheet:
